

# Green Infrastructure & Low-Impact Development



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# Agenda

State vs. Municipal Stormwater Regulation

Vermont's Green Infrastructure Program

Green Infrastructure v. Low-Impact Development

Best Management Practices

# State Stormwater Management



1+ acres of impervious = jurisdictional

Variety of permits required

Acceptable Treatment Practices

Voluntary Stormwater Management Credits

# Municipal Stormwater Management

Stormwater Ordinances / By-Laws

Stormwater Utilities

Individual Implementation of LID Practices





# VT Green Infrastructure Program



Photo by Justin Kenney

Sub-jurisdictional focus

Strategic Plan Development

Individual Implementation

Grant Management

Outreach & Education

Professional Development

# Green Infrastructure

Systems & practices used to restore and maintain natural processes in order to reduce the hydrologic and water quality impacts of the built environment while providing multiple societal benefits.



<http://switchboard.nrdc.org/blogs/rhammer/media/infiltration.jpg>

# Low-Impact Development (LID)



LID is an approach to wet weather management that is cost-effective, sustainable, and environmentally friendly. LID best management approaches and technologies infiltrate, evapotranspire, capture and reuse stormwater to maintain or restore natural hydrologies.

# Best Management Practices (BMPs)



Photo by Justin Kenney

Site-scale management  
practices

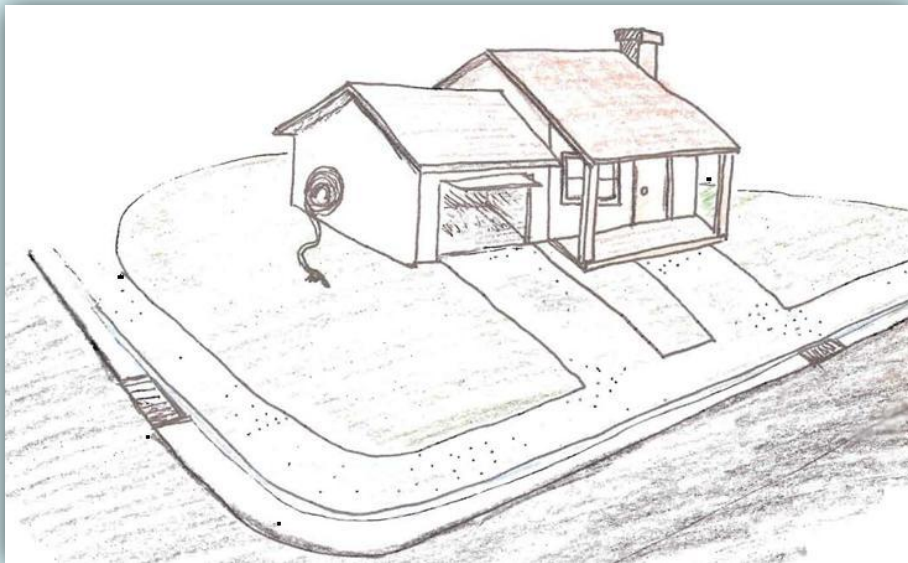
Structural & *Non*-structural



# Structural BMPs

A micro-scale and distributed management technique used to maintain predevelopment site hydrology.

Structural BMPs can be applied during initial development or “easily” retrofitted to an existing site.



# Stormwater / Rooftop Disconnection





# Capture & Use - Cisterns



Public Works Garage – St. Albans

# Capture & Use - Cisterns



State Forensics Lab - Waterbury



# Capture & Use – Rain Barrels



<http://schaumburglibrarygreenside.files.wordpress.com/2010/04/rain-barrel.jpg>



<http://houseofmercyug.org/wp-content/uploads/2010/06/rain.barrels.jpg>

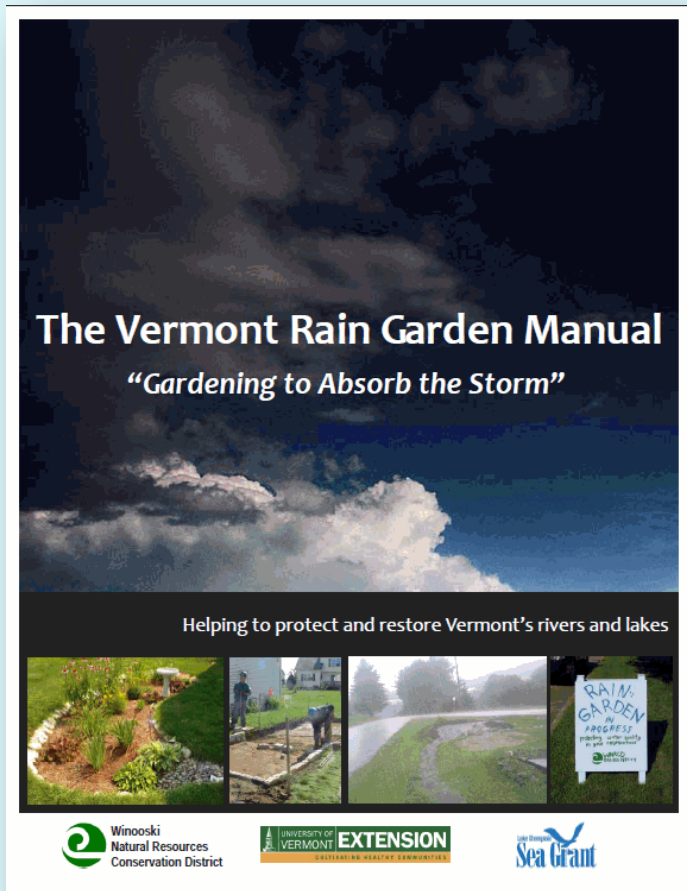
# Rain Gardens



Irving Heights - Rutland



# WNRCD – Rain Garden Manual



Park Street - Rutland

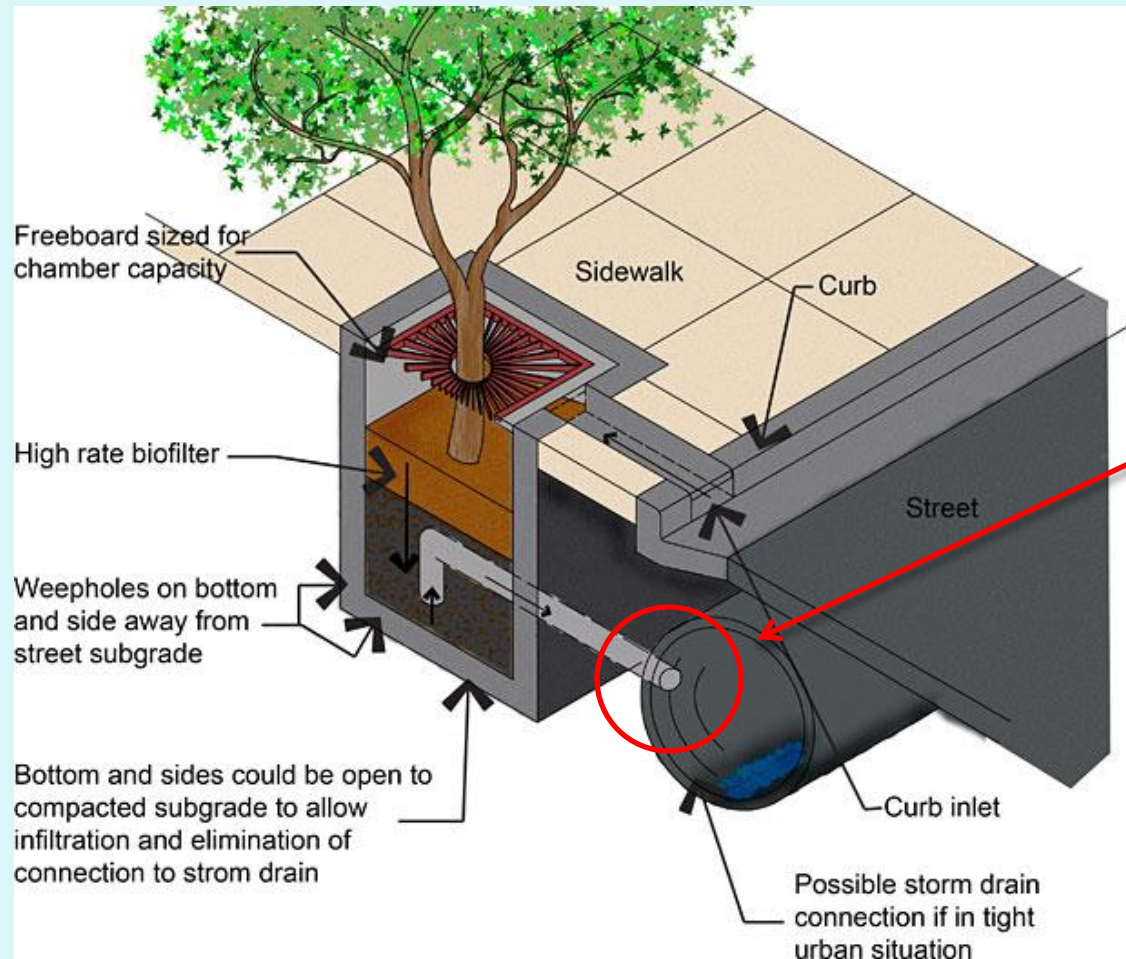


# Vegetated Swale





# Tree Boxes



# Tree Boxes

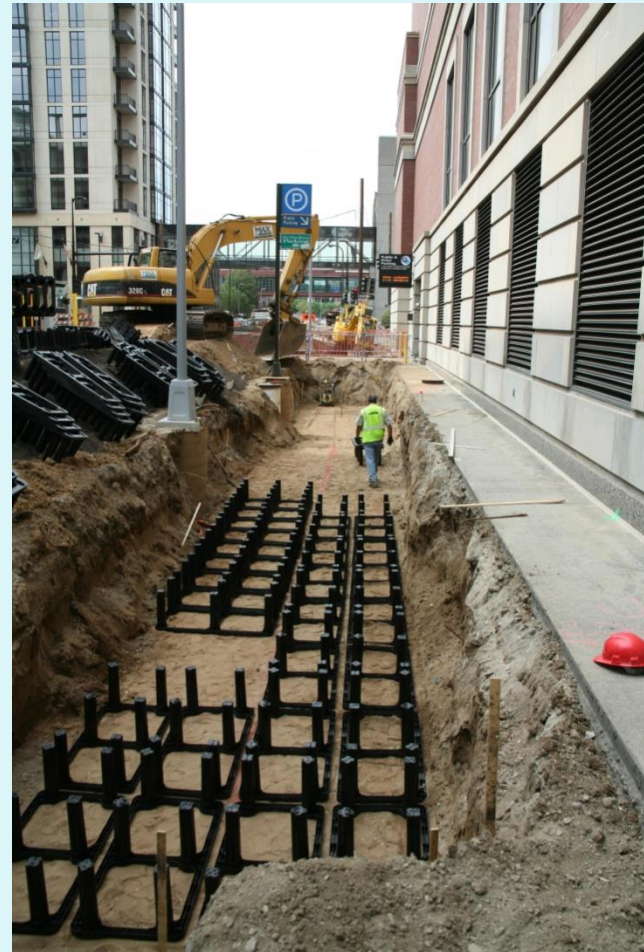




# Silva Cells



# Silva Cells





# Infiltration Trenches / Galleries



State Street - Montpelier



# Green Roofs



# Green Roofs



Private Residence – Mad River Valley, VT



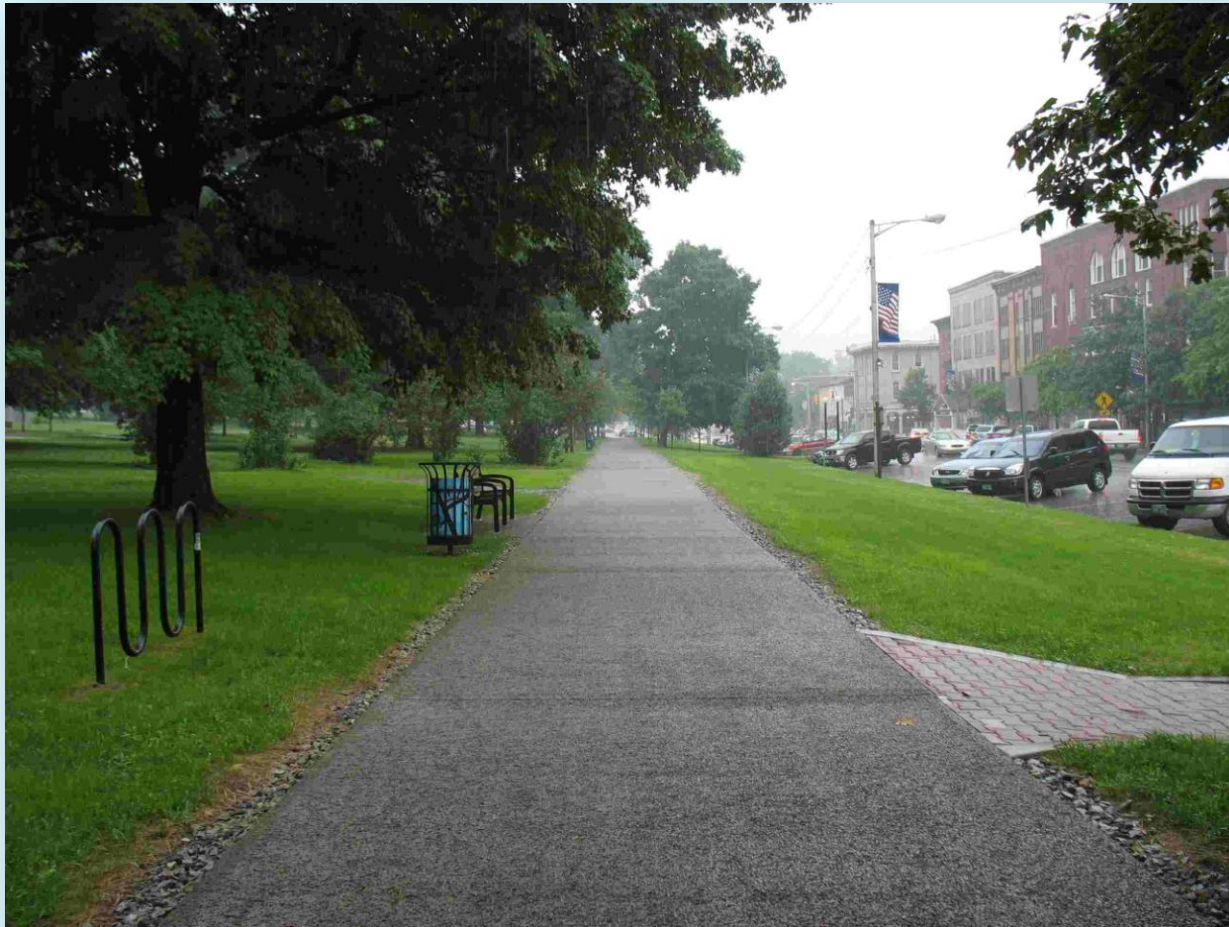
# Green Roofs



Heritage flight hangar – Burlington International Airport



# Porous Asphalt



Downtown St. Albans

# Permeable Pavers



State Forensics Lab - Waterbury



# Pervious Concrete



← Pease Lot, Burlington Waterfront



Fletcher Free Library, Burlington →



# Constructed Wetlands





# Buffer Re-Vegetation



# Non-Structural BMPs

There are no physical structures associated with these types of BMPs. Non-structural BMPs typically lessen the need for the more costly structural BMPs.

Non-structural BMPs can be achieved through such things as education, management and development practices. Some examples include ordinances and practices associated with land use and comprehensive site planning.



# Protect Sensitive Areas





# Protect Existing Riparian Buffers

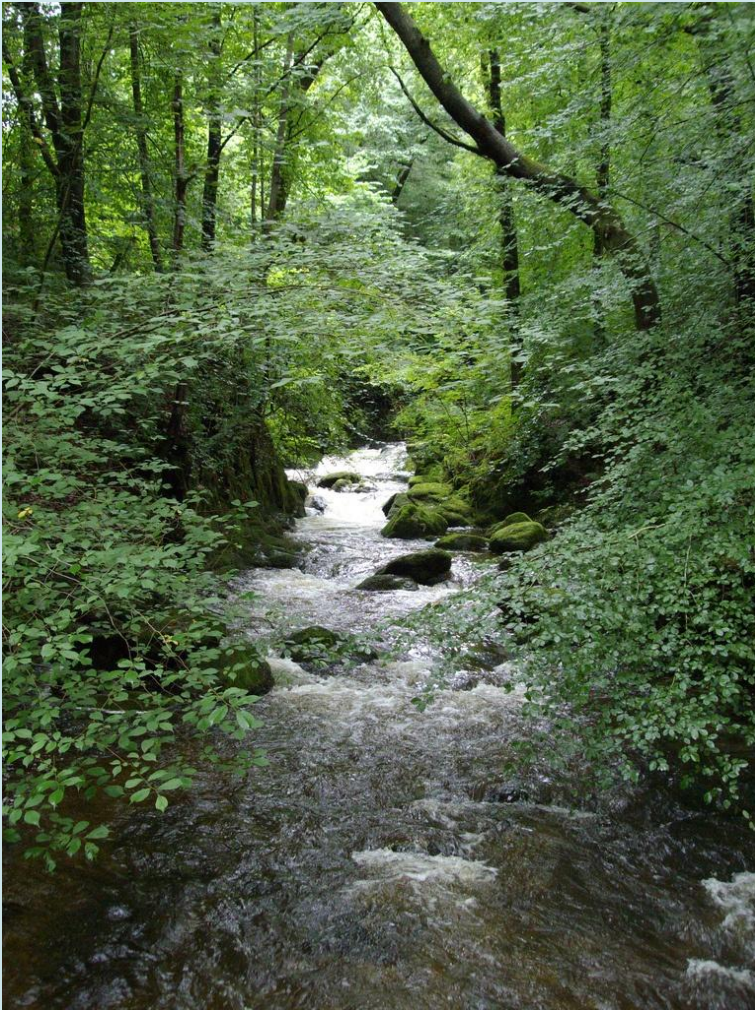


Photo by F.X. Browne



# Conservation Design





# Conservation Design



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# Questions?

